

BENCHMARKS

VOLUME 5 NUMBER 5

NORTH TEXAS STATE UNIVERSITY

JUNE 1984

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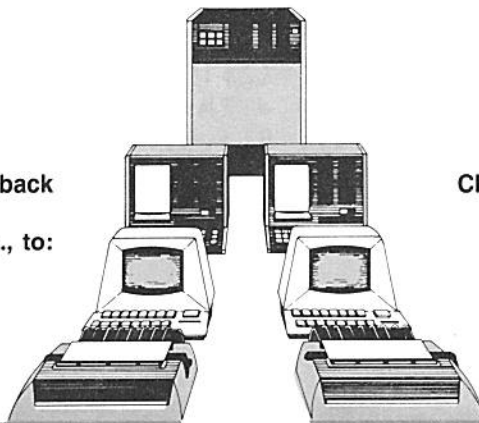
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BENCHMARKS Reader/User feedback is encouraged.

Send all letters, suggestions, etc., to:
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Services Available to Users of the NTSU Computing Facilities

The NTSU Computing Center is located in the Information Sciences Building, Room 119. Telephone: (817) 565-2324. HELP DESK phone: 565-4050.

INFORMATION AND ID CODES - Carolyn Goodman

BENCHMARKS QUESTIONS/CONTRIBUTIONS, ETC. - Claudia Lynch

STATISTICAL/RESEARCH SUPPORT - George Morrow, Victor Loos,
Dave Molta

STUDENT PROGRAMMING PROBLEMS - CSCI Department, Room 550L, GAB
BCIS Department, Room 152, BA

JCL & DEBUGGING PROBLEMS - Help Desk

PRE-RESEARCH COUNSELING - George Morrow, Victor Loos, Dave Molta

DATA ENTRY & KEYPUNCH - Betty Grise

TEST SCORING & ANALYSIS - Betty Grise

PASSWORD AND DISK SPACE PROBLEMS - Carolyn Goodman

OPERATING SYSTEM PROBLEMS - Help Desk

ADMINISTRATIVE APPLICATIONS - Coy Hoggard

COMMUNICATION/TERMINAL PROBLEMS - Help Desk

PRINTOUT RETRIEVAL - RJE Operators

Summer Computing Hours

Computing facilities will be open during the following hours throughout the Summer Semesters (not applicable to holidays):

Computing Center RJE:	7 a.m. Monday - Midnight Saturday Noon - Midnight Sunday
ISB 110 Terminal Area:	Monday - Thursday, 7:30 a.m. - Midnight Friday, 7:30 a.m. - 6 p.m. Saturday, 8:30 a.m. - 7 p.m. Sunday, 2 p.m. - 10 p.m.
College of Business:	Monday - Saturday, 8:15 - Midnight Sunday, 12:15 p.m. - Midnight
Room 550, GAB:	Monday - Thursday, 8 a.m. - 11 p.m. Friday, 8 a.m. - 8 p.m. Saturday, Noon - 5 p.m. Sunday, 2 p.m. - 10 p.m.

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Exceptions to Summer Computing Schedules

The following are exceptions to the announced computing schedules for the summer.

GAB 550:	7/4	Wed:	10 a.m. - 5 p.m.
	7/11 - 7/13	Wed - Fri:	8 a.m. - 5 p.m.
	7/14	Sat:	CLOSED
	7/15	Sun:	2 p.m. - 8 p.m.
	7/16	Mon:	8 a.m. - 10 p.m.
	8/17	Fri:	8 a.m. - 5 p.m.
	8/18 - 9/3	:	CLOSED

College of Business : Room 153 will be closed all
All computing will continue
as usual in room 152.

Dial Access Changes

The telephone numbers 565-3300 and 565-3899 are no longer viable. Check the COMMUNICATIONS section of this newsletter for a list of valid numbers.

User Help Desk a Reality

The "help desk" that was announced in the last issue of Benchmarks is now alive and well and residing in ISB 110 (in the back of the Science and Technology Library). A staff member will be available in person and/or by phone to answer questions, to give personalized instruction, and to consult on programming problems. The help desk is designed to be our primary means of providing information and assistance to users, especially after business hours and on weekends. Help desk staff are skilled in a wide variety of areas, including the use of MUSIC, VAX, JCL, various programming languages, and are trained in troubleshooting network and terminal problems.

The phone number and scheduled hours of operation for the HELP DESK are:

PH: 565-4050	MON-THUR	8:00 a.m. - 10:00 p.m.
	FRI	8:00 a.m. - 6:00 p.m.
	SAT	9:00 a.m. - 6:00 p.m.
	SUN	2:00 p.m. - 10:00 p.m.

The help desk does not replace the student programming

consultants provided by the Computer Science and BCIS departments. Computing Center help desk personnel are not authorized to consult on classroom programming assignments.

Keeping up With the Latest in Computing at NTSU

Don't forget to check the NEWS at least once a day, on whatever system you are using. This is where the latest happenings in computing at NTSU will be posted. You should consider the NEWS and HELP facilities your primary sources of information on things you need to know. BENCHMARKS is an adjunct to this information and also serves to document and announce things that might not be appropriate for NEWS or HELP.

Keeping Track of All Those Computers: The System Status Monitor (SSM) at NTSU By Kim Stickney, VAX Administrator

An ongoing VAX software project, combined with the acquisition of some new equipment, has resulted in the completion and implementation of a campus-wide televised display system showing the condition of the various computer systems on campus at any given time. This integrated hardware and software system uses the Local Area Network (LAN) to query various computers and collect information about their current status; the information is then analyzed and displayed in an appropriate form on the television monitors throughout the campus. This information is updated approximately every five minutes, to keep users adequately informed about the systems they are doing work on.

How does it work? The SSM can be described as a query and reply automaton with a dedicated display channel. A program (written in C) reads a list of LAN addresses (such as A780, 8040, 3270), each of which is linked with an appropriate query (such as "CALL A780") and a response (such as "Username:"). This information database is maintained in a file which can be easily modified to accomodate the changing network typology. Special software functions are built into the program to handle error conditions, timeouts, and other exceptions; this becomes more complex the farther the SSM attempts to "go into" a system, since the tree of possible responses (and hence erroneous responses) becomes larger and larger. It currently appears sufficient to go only two or three levels of queries into a system in order to be able to report on it satisfactorily. As an example, "CALL 8040", "DIAL MUSIC", which represents two levels, is generally sufficient to determine whether MUSIC is up or down, providing the expected responses are received.

What does it run on? Currently the SSM is running on the A780 VAX/VMS system, as this was a particularly hospitable environment for developing the program. Of course, if A780 goes down it cannot report on itself! Consequently, plans are underway to migrate the SSM to a PDP-11/24 computer running the RT11 operating system (we are waiting on a software shipment from DEC). The great advantage of writing SSM entirely in C is that

about 95% of the code is transportable and hardware-independent. The remaining 5%, though still in C, must be rewritten for the target system. This small module contains the hardware specific I/O code, and thus accesses specific registers and system calls unique to the target environment. It is entirely possible that the SSM may reside on a TI PC in the near future!

What else can it do? The SSM also has an operator message entry feature. This will be used by the 24-hour operators in the GAB room 550 area, to put out special messages when appropriate. We hope that the System Status Monitor will serve as a useful tool in keeping the NTSU computer user community well informed about the available computing resources.

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Backup Schedule for OS/MVS

OS/MVS disk packs (academic and administrative) are backed up daily, Tuesday through Saturday, from 4-6:30 a.m., and Sunday from Midnight to 3 a.m. A backup of all the operating systems and their contents is done once every two weeks at some low activity period over a weekend.

NAS/8040 Performance Statistics for May

SYSTEM	SCHEDULED OPERATING HOURS	PLANNED MAINT. HOURS	PLANNED PRODUCTION HOURS	UNPLANNED MAINT. HOURS	PRODUCTION HOURS ACHIEVED	SYSTEM UPTIME
VM/SP2	744	0.17	743.83	0.88	742.95	99.9%
MUSIC	744	31.19	712.18	6.82	705.99	99.0%
MVS/JES2	744	0.17	743.83	2.54	741.29	99.7%
COMPLETEA	744	0.34	743.66	3.69	739.97	99.5%

CPU availability equals approximately 100% uptime.

System Uptime=(Production Hrs Achieved)/(Planned Production Hrs)

Production Hrs Achieved = (Planned Production)-(Unplanned Maint.)

Scheduled Operating Hrs = (Planned Maint.) + (Planned Production)

MUSIC Planned Maintenance Hours include 21.10 hrs system backup.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes:

CPU, Tape, and Disk Subsystems (NAS)

1. Modify UCW's for AP-190L Array Processor	0.63 HOURS

Terminal Control Systems (MEMOREX)

1. 1270 TCU Line Failures	3.72 HOURS

Miscellaneous

1. Undetermined Causes for Systems Restarts	3.51 HOURS
2. VM/SP2 System Tuning/Improvements	0.43
3. MVS/JES2 System Improvements	0.23
4. Cable in AP-190L Array Processor	0.17
4. Install 5.2 Release of MUSIC System	9.92

TOTAL	14.26 HOURS

GRAND TOTAL	18.61 HOURS
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HP 2000 Coordinator Resigns

Jeff Brooks, longtime HP 2000 coordinator and general "Jeff-of-all-trades" has resigned his part-time position at NTSU to pursue his computing interests further at Texas Instruments. He is, as they say, "gone but not forgotten." If you look closely, you may see him wandering the hallowed halls of academia this next year, in pursuit of another goal of his, a B.S. in Computer Science.

New Blood for Academic Computing Services

Things would just be too dull around here without a few new people to liven the place up every once in a while. Since Jeff Brooks resigned, we thought we had better find someone to take over his duties, and who did we come up with but Dave Molta. Dave comes to us from the Political Science Department (no comments please!) here at NTSU, where he is working on his Ph.D. Besides taking over the administration of the HP, Dave will use his considerable expertise in statistical packages and various microcomputer applications to consult with and/or otherwise advise the academic community. Welcome aboard Dave!

Contrasts in BMDP

(Adapted by Victor Loos from BMDP Communications, Vol. 17, No. 1, April, 1984)

Contrasts are powerful statistical tools for testing a variety of

relationships among means, especially when used as a supplement to an analysis of variance. A contrast is a linear combination of means with coefficients a_i that sum to zero

$$a_1X_1 + a_2X_2 + \dots + a_kX_k.$$

The following are types of contrasts available in BMDP.

Pairwise Differences. A pairwise difference is the simplest type of contrast, where the hypothesis tested is

$$H_0: m_1 - m_2 = 0,$$

and the contrast coefficients are (1, -1).

Combinations of Means. Depending on the research question being asked, it may be of interest to test a combination of several means. For example, if we want to compare the means for treatment groups A and B with the mean for a control group, our hypothesis is

$$H_0: (m_A + m_B)/2 = m_C$$

which may be rewritten as

$$H_0: (m_A + m_B)/2 - m_C = 0.$$

The contrast coefficients are (1/2, 1/2, -1) or equivalently, (1, 1, -2).

Regression Contrasts. When the categories of an ANOVA effect are ordered, a test of a regression-type contrast may provide a more sensitive analysis than the usual analysis of variance, which does not consider the order among the groups. For example, if subjects are administered one of four drug doses (group 1--lowest, to group 4--highest) we could test the hypothesis

$$H_0: -3m_1 - m_2 + m_3 + 3m_4 = 0$$

to see if the response exhibits a significant linear change across the ordered groups. The contrast coefficients are (-3, -1, 1, 3). "Rejection" of this hypothesis means that there is a significant linear increase (or decrease) across the ordered cell means. We could also test whether the change across the means follows a curve (a quadratic curve) by using the coefficients (1, -1, -1, 1). If we have three doses instead of four, the linear coefficients would be (-1, 0, 1), and the quadratic, (1, -2, 1). The coefficients for different numbers of means are found in many statistics books. The ones above were taken from Table 15-27 in Dixon and Massey (1983).

Tests of Simple Effects. When an interaction is significant in a factorial ANOVA design, researchers often stratify the design on one or more factors in the interaction, and use the error term from the complete design to perform ANOVA tests within each stratum. For example, if we ran an experiment with three levels of treatment (A, B, Control) and two levels of sex (M = Male, F = Female) we could test the hypothesis

$$H_0: m_A + m_B - 2m_C = 0$$

separately for each sex, or alternatively, we could test

$$H_0: m_M - m_F$$

within each treatment. Such tests provide a description of the interaction (how the means differ within the various levels of the design).

To supplement the tests discussed previously, we often find it useful to plot the cell means. Program 9D, in the 1983 release of BMDP, has three new types of cell mean plots.

A Priori or Post Hoc Approach?

Testing contrasts of interest can be approached in two ways: (1) The comparisons are planned, i.e., before you collect the data, you state specific contrasts to test (a priori). (2) The analysis is exploratory, i.e., before you collect the data, you are unsure of what differences might occur, so you scan many comparisons after the analysis of variance test (post hoc),

When many comparisons are tested after the data are examined, errors of inference can result (e.g., you can declare that two means differ significantly when they actually do not). To protect against such errors, several post hoc procedures have been developed. The Bonferroni, Tukey, Scheffe, and Dunnett procedures for pairwise mean differences, and the Duncan and Student Newman-Keuls multiple range methods, are available in the 1983 release of BMDP (program 7D).

We recommend that the a priori approach be used whenever possible, since you pay a penalty for the privilege of examining all possible comparisons in a post hoc procedure. If you plan a few specific comparisons before the data are collected, you will be able to detect differences, if they truly exist, with smaller sample sizes.

It should also be pointed out that some researchers carry out the analysis of a planned design by splitting the sum of squares (e.g., due to the between-group TREATMENT effect in the analysis of variance table) into separate parts, one for each degree of freedom. To do this they select one contrast for each degree of freedom and multiply each data value by its respective contrast coefficient. When the cell sample sizes are equal, the same analysis can be obtained much more simply by multiplying the planned coefficients by the cell means. In addition to equal sample sizes, the coefficients must be orthogonal in order to have the sums of squares associated with the contrasts sum to the total sum of squares for the ANOVA effect. This means that the products of the coefficients also sum to zero.

linear	-1	0	1	
quadratic	1	-2	1	
product	-1	0	1	sum = 0

We frequently apply contrast coefficients to the cell means, because it is more fruitful to have specific tests that address research questions than to use the usual ANOVA tests that simply point to "significant effects." When sample sizes are unequal, the results of the tests for the contrasts will be correlated. However, when sample sizes do not differ greatly, the results can

still be useful.

BMDP Contrast Features

We now describe tests of contrasts available in five BMDP programs.

Pairwise Differences in 7D. The TTEST option in the PRINT paragraph provides both separate and pooled variance t-tests for every pair of means, with Bonferroni adjustments to the significance levels. The separate variance test uses the variance from the two groups being compared; the pooled variance test pools variances from all groups. For each type of test, 7D prints probabilities to four decimal points. Thus, if an investigator has an a priori interest in testing only selected pairs (not all possible pairs), he may adjust the Bonferroni procedure to allow fewer comparisons. For example, if five pairwise differences are to be tested, the Bonferroni approach uses the one percent level for each test to assure that alpha is held to less than $5 \times 1\% = 5\%$, simultaneously across all five tests.

This approach is useful for testing pairwise differences after the identification of a significant interaction in a two-way ANOVA design. It is important to stress that m (the number of specific comparisons of interest) should be selected before the test. Simply choosing the two means that differ most greatly after the test as the only test of interest does not maintain appropriate levels of significance.

Pairwise mean differences may also be tested in the COMPARISON paragraph (new in the 1983 release), using the options BONFERRONI, TUKEY, SCHEFFE, DUNNETT, DUNCAN, and NK (Newman-Keuls).

Contrasts and Pairwise Tests in 1V. In the DESIGN paragraph, the user may specify coefficients for contrasts among the group means. The coefficients may be selected to test pairwise differences, hypotheses involving a combination of means, or regression-type hypotheses across ordered means. For example, for an ANOVA effect with three ordered levels, we test whether the means increase (or decrease) along a straight line by specifying

CONTRAST IS 1, 0, -1.

When such contrasts are tested along with many other comparisons (e.g., pairwise mean differences), the user should use a Bonferroni adjustment for the significance level.

Pooled variance t-tests are automatically printed for every pair of groups. However, again the user must apply the Bonferroni adjustment to the probabilities to obtain protection for the simultaneous tests. The t-test calculations are the same as the 7D pooled variance results obtained using TTEST in the PRINT paragraph.

Regression-type Contrasts for Repeated Measures Data in 2V. For repeated measures designs (each subject is measured more than once), the instruction ORTHOGONAL in the DESIGN paragraph automatically splits the sums of squares for each subject's response over time into single-degree-of-freedom linear, quadratic, etc. components. The tests associated with each individual contrast are still valid when the assumptions of equal variance and independence of the orthogonal components have been violated, while the tests for the pooled results are not. In addition, statements from the single-degree-of-freedom tests may be more interpretable when reporting results. "The response of the subjects exhibited a significant linear decrease over time" says much more than "The response changed significantly over time."

Contrasts and Tests of Simple Effects in 4V. Users may test hypotheses about combinations of means or regression-type relationships across ordered means by specifying contrast coefficients and the instructions CONTRAST or REGRESSION with the TYPE instruction in the DESIGN paragraph. Tests of simple effects are available using the SIMPLE procedure in the ANALYSIS paragraph. Examples follow.

Imagine that treatment (treatment A, treatment B, and a control group) is a significant effect in a factorial and/or repeated measures design, and that treatment is not part of a significant interaction. To test A and B versus the control groups we use the coefficients (1, 1, -2). In 4V, however, we need only state (1, 1, -1) because the program only accepts 1's, -1's, or 0's (it changes the -1 to a -2). The instructions for this contrast are

```

DESIGN      FACTOR IS TREATMNT.
            TYPE IS BETWEEN, CONTRAST.
            CODE IS READ.
            VALUES ARE 1, 1, -1.
            NAME IS 'A AND B VS CONTROL'.      /
ANALYSIS    UNISUM.      /

```

The TYPE instruction tells the program to generate a CONTRAST across the levels of the BETWEEN factor. (If our contrast was across the levels of a repeated measures factor we would specify WITHIN instead of BETWEEN). UNISUM requests a compact summary table of the ANOVA results and remains in effect for the contrast results.

If the dose factor mentioned in the discussion of regression contrasts is part of a larger ANOVA design (and dose is a significant main effect and is not part of significant interactions), a linear regression contrast may be specified as follows:

```

DESIGN      FACTOR IS DOSE.
            TYPE IS BETWEEN, REGRESSION.
            CODE IS READ.
            VALUES ARE -3, -1, 1, 3.
            NAME IS 'LINEAR DOSE'.  /
ANALYSIS    UNISUM.  /

```

When interactions are significant and tests of simple effects are needed, 4V has an easy-to-use procedure to produce tests for all strata of the design. For example, if the ANOVA design factors are TREATMENT (A and B), SEX, and CITY (Chicago, New York, and Boston), and you specify

```

ANALYSIS PROC IS SIMPLE.
COMBINE IS 2.  /

```

then in turn, the levels within each factor are held fixed and tests of simple effects are computed. The COMBINE instruction requests tests for combinations of levels of two factors (e.g., hold males and Chicago fixed).

4V reports F tests using the error term for the complete design) with probabilities for the following:

males	a city by treatment design
males in Chicago	a one-way treatment design
males in New York	a one-way treatment design
males in Boston	a one-way treatment design
females	a city by treatment design
females in Chicago	a one-way treatment design

.
.
. and so on ...

However we caution that adjustments to the probabilities should be considered when the results of so many tests are studied simultaneously.

You can also specify tests of particular interest in the DESIGN paragraph. For example, to test whether the mean response of treatment A differs from that of treatment B for males who live in Chicago, specify

```

DESIGN      FACTORS ARE SEX, CITY, TREATMNT.
            LEVEL(SEX) = MALE.
            LEVEL(CITY) = CHICAGO.
            LEVEL(TREATMNT) = A, B.
            CODE = EFFECT.
            TYPE = BETWEEN, CONTRAST.  /

```

Contrasts in 7M. The user may specify coefficients for contrasts (using CONTRAST in the DISCRIMINANT paragraph) like those described under 1V, resulting in multivariate contrasts among the groups. These contrasts are also used in the calculations of the

F-to-enter and F-to-remove statistics that drive the stepwise selection of variables.

Conclusion

Contrasts are a powerful statistical tool for testing a variety of relationships among means, especially when used as a supplement to an analysis of variance. The more experience you gain with contrasts, the more you will be impressed by the power you can add to your data analysis.

References

Dixon, W. J. and F. J. Massey (1983). Introduction to Statistical Analysis, fourth edition, New York, McGraw-Hill.

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Dialing Up NTSU Computers Over the Telephone

Phone numbers for the local area network are:

```

(817) 565 - 3499
              3900
              3966
              3989
              3999
              4025
              4030
D/FW METRO 429 - 6006

```

All the numbers EXCEPT 565-4030 and 565-3966 are for 300 baud communications. The numbers 4030 and 3966 will accept either 1200 or 300 baud communications. They have an autobaud feature that requires the user to hit the <RETURN> key repeatedly until the receiving modem can determine the appropriate baud rate. After a communications link has been successfully established, the user will receive the # prompt. At this point, it will be necessary to issue the appropriate CALL command to connect with a computer.

```

CALL 8040 will connect with MUSIC
CALL 8300 will connect with MUSIC at 300 baud
CALL 3270 will connect with MUSIC through the 3270
           protocol converter
CALL A780 will connect with VAX system A
CALL B780 will connect with VAX system B
CALL 2000 will connect with the HP-2000 computer

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MUSIC Backup Hours

A message will be sent to all users signed on to MUSIC approximately 10 minutes before backups are begun. It will be in the form * * MUSIC SHUT DOWN AT xxxx AM - SCHEDULED BACKUP *. To find out the backup hours while signed on to MUSIC, enter HELP HOURS. The following backup schedule is currently in effect:

Tuesday	3 a.m. (for about 3 hours)	Weekly backup
Wednesday - Saturday	4 a.m. (for about 2 hours)	Daily backup
Saturday	Midnight (for about 2 hours)	Daily backup

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VAX Backup Schedule

Incremental backups of both VAX systems are performed Monday through Thursday at 5 p.m. Any files that have been created or changed are backed up. Users do not have to log out, but any files that are open at the time of the backup will NOT be backed up.

Full backups of both systems are done every Friday at 5 p.m. Again, users do not have to log out, but any files that are open will NOT be backed up.

A "stand alone" backup of both systems is done on the last working day of the month. During this time, all system software, as well as user files, are backed up. The systems must be taken down for this backup, which will usually not last more than 1/2 hour. All users that are logged on will be warned of the impending backup, and must log out.

NOTE: No backups are taken on the weekends. Requests for restoration of files should be made via MAIL to the username OPERATOR.

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The Computing Center is offering a series of short courses during the summer. These courses will be held in Room 110 of the Science and Technology Library (ISB) unless otherwise noted. Following are the dates and times for each course. Please pre-register to attend. Only 20 people will be admitted per section. Courses marked with * require knowledge of the MUSIC Context Editor. Courses marked with ** require familiarity with VMS and EDT gained from the computer assisted instruction courses VMSCAI and EDTCAI.

1. Eight separate 2-hour introductory sessions on the MUSIC interactive operating system.

Monday, June 25: 10 a.m. - 12 noon
7 p.m. - 9 p.m.

Tuesday, June 26: 10 a.m. - 12 noon
2 p.m. - 4 p.m.

Monday, July 23: 10 a.m. - 12 noon
7 p.m. - 9 p.m.

Tuesday, July 24: 2 p.m. - 4 p.m.
7 p.m. - 9 p.m.

2. Four separate 1-hour sessions on the use of the 3270 Protocol Converter and full screen editing in MUSIC.*

Monday, June 25: 2 p.m. - 4 p.m.

Tuesday, June 26: 7 p.m. - 9 p.m.

Monday, July 23: 2 p.m. - 4 p.m.

Tuesday, July 24: 7 p.m. - 9 p.m.

3. Two separate 1-hour introductory sessions on the VAX minicomputers.**

Friday, June 29: 1 p.m. - 2 p.m. Instructor: Kim Stickney

Friday, July 27: 1 p.m. - 2 p.m. Instructor: Kim Stickney

4. Two separate 2-hour introductory sessions on SPSS-X.*

Thursday, June 28: 10 a.m. - 12 noon. Instructor: Victor Loos

Thursday, July 26: 10 a.m. - 12 noon. Instructor: Dave Molta

5. Two separate 2-hour introductory sessions on SAS.*

Wednesday, June 27: 10 a.m. - 12 noon Instructor: Dave Molta

Wednesday, July 25: 10 a.m. - 12 noon Instructor: Dave Molta

6. Two separate 2-hour introductory sessions on Waterloo SCRIPT.*

Friday, June 26: 10 a.m. - 12 noon. Instructor: Victor Loos

Friday, July 27: 10 a.m. - 12 noon. Instructor: Dave Molta

A sign-up sheet for these short courses is included at the end of this issue.


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HP-2000 Backup Schedule

Routine system backups are scheduled to be performed at the following times:

8 a.m. Monday through Friday for approximately 20 minutes;
4 p.m. Friday for approximately 1.5 hours.

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*   C O M P U T I N G
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NAS/6650 Performance Statistics for May

SYSTEM	SCHEDULED OPERATING HOURS	PLANNED MAINT. HOURS	PLANNED PRODUCTION HOURS	UNPLANNED MAINT. HOURS	PRODUCTION HOURS ACHIEVED	SYSTEM UPTIME
MVS/JES2	744	2.23	741.77	2.58	739.19	99.7%
COMPLETEA	287	0.22	286.78	2.75	284.03	99.0%
ADABASA	744	2.89	741.11	8.65	732.46	98.8%

CPU availability equals approximately 100% uptime. Please consult the NAS/8040 Performance Summary for an explanation of cell entries. It can be found under the OPERATIONS section of this newsletter.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes:

BENCHMARKS**JUNE, 1984**CPU, Tape, and Disk Subsystems

1. Maintenance on 800 BPI Tape Drive

0.77 HOURS
-----Terminal Control Systems (MEMOREX)

1. 1270 TCU Failures

0.82 HOURS
-----Miscellaneous

1. Undetermined Causes for Systems Restarts

0.91 HOURS

2. Cable in IBM 3274 TCU

0.58

3. Gen Unit Addresses for IBM 3274 TCU

0.58

4. Install Hydra II Protocol Converter

1.73

5. MVS/JES2 System Improvements

2.00

6. Restore Student Master File

0.60

7. COMPLETA File Update

0.17

8. ADABASA Operating Procedure Error

4.77

TOTAL

11.34 HOURS

GRAND TOTAL

12.93 HOURS

INDEX TO PAST ISSUES

In order to utilize BENCHMARKS to its fullest capacity and avoid redundancies, an index of issues containing information considered **still pertinent** to the NTSU Computing Center is included once a semester, referencing articles that appeared the previous semester.

<u>SUBJECT</u>	<u>VOL/NO</u>	<u>MONTH/YEAR</u>	<u>PG</u>
1. OF GENERAL INTEREST			
Manager of Computer Services			
Becomes COMPUTERWORLD Columnist	5/1	Jan/Feb/84	9
Public IDs Still Available	5/1	Jan/Feb/84	10
New Manager of Academic Computing Hired	5/2	March/84	2
Using the Computer for Research:			
Part XIII - BMDP Continued	5/2	March/84	4
2. ACCESS TO COMPUTING FACILITIES			
Terminal/Micro Settings for Dial-up			
Access	5/2	March/84	22
Dial-Up Communications Problems	5/3	April/84	8
3. HARDWARE			
A) General			
DIABLO Moved to Matthews Hall	5/1	Jan/Feb/84	13
B) NAS/8040			
Additional Memory Added to NAS/8040	5/3	April/84	2
D) VAX 11/780			
Preventive Maintenance	5/3	April/84	9
E) Microcomputers			
Disk Drive Head Failures on the Texas			
Instruments PC	5/3	April/84	11
G) Laser Printer			
The Laser Printer and Overridden			
SYSOUT DD Cards	5/1	Jan/Feb/84	14
LASER Not Always Best Choice	5/1	Jan/Feb/84	14
Print Quality of the Laser Printer	5/2	March/84	2
4. INPUT			
Changes to the Resource Access Control			
Facility (RACF) at NT	5/1	Jan/Feb/84	11
MVS and RACF	5/1	Jan/Feb/84	14
VSAM Comes to NTSU	5/4	May/84	2
5. OUTPUT			
No More Punched Output	5/1	Jan/Feb/84	10
New Procedure for Secure Output	5/1	Jan/Feb/84	11
Printer Copy Policy	5/1	Jan/Feb/84	11

<u>SUBJECT</u>	<u>VOL/NO</u>	<u>MONTH/YEAR</u>	<u>PG</u>
6. SERVICES AVAILABLE			
Consulting Services Available to Student Programmers	5/1	Jan/Feb/84	2
After-hours Assistance With Terminal and Network Problems	5/1	Jan/Feb/84	13
7. SOFTWARE			
A) General			
Multidimensional Scaling Programs	5/2	March/84	4
B) MUSIC			
New User Friendly Menu Facility Available	5/3	April/84	2
Notes on Using Direct Access COBOL Programs	5/4	May/84	6
D) SAS			
RAQL Acquired	5/2	March/84	3
E) BMDP			
Explaining BMDP2T	5/3	March/84	4
G) The VAX 11/780s			
Using EDT With the Televideo 970 Keypad	5/3	April/84	9
Intersystem Data Transfers	5/3	May/84	8
G) Microcomputers			
MUSIC Communications Program for CP/M	5/1	Jan/Feb/84	19
CP/M Users Group Forming	5/1	Jan/Feb/84	19
Communications Programs for Micros	5/4	April/84	9
9. PERFORMANCE STATISTICS			
A) NAS/8040			
November, December	5/1	Jan/Feb/84	15
January, February	5/2	March/84	23
March	5/3	April/84	3
April	5/4	May/84	4
B) NAS/6650			
March	5/3	April/84	12
April	5/4	May/84	11
9. UTILITY APPLICATIONS			
New Disk Mapping Utility	5/1	Jan/Feb/84	13

Registration Form for Computing Center Short Courses

Please complete this form and return it AS SOON AS POSSIBLE if you wish to attend any of the short courses listed below. You may also register by phone by calling 565-2324.

NAME: _____ PHONE: _____

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I wish to attend:

Introduction to MUSIC

- _____ Monday, June 25, 10 a.m.
- _____ Monday, June 25, 7 p.m.
- _____ Tuesday, June 26, 10 a.m.
- _____ Tuesday, June 26, 2 p.m.
- _____ Monday, July 23, 10 a.m.
- _____ Monday, July 23, 7 p.m.
- _____ Tuesday, July 24, 2 p.m.
- _____ Tuesday, July 24, 7 p.m.

Introduction to the 3270 Protocol Converter

- _____ Monday, June 25, 2 p.m.
- _____ Tuesday, June 26, 7 p.m.
- _____ Monday, July 23, 2 p.m.
- _____ Tuesday, July 24, 7 p.m.

Introduction to SAS

- _____ Wednesday, June 27, 10 a.m.
- _____ Wednesday, July 25, 10 a.m.

Introduction to SPSS-X

- _____ Thursday, June 28, 10 a.m.
- _____ Thursday, July 26, 10 a.m.

Introduction to Waterloo SCRIPT

- _____ Friday, June 26, 10 a.m.
- _____ Friday, July 27, 10 a.m.

Introduction to VAX

- _____ Friday, June 29, 1 p.m.
- _____ Friday, July 27, 1 p.m.

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